

BIRD-BANDING

A JOURNAL OF ORNITHOLOGICAL INVESTIGATION

Vol. XXIX

October, 1958

No. 4

BLUE JAYS AT NASHVILLE, TENNESSEE MOVEMENTS, NESTING, AGE

BY AMELIA R. LASKEY

One thousand Blue Jays (*Cyanocitta cristata*), banded in twenty-five years (1932-1957) at my home and substations within a five-mile area at Nashville, Tennessee, have yielded considerable data on the movements, nesting and longevity of this species.

The most remarkable life history among these birds is that of the O'Jay family. O'Jay, who proved by later behavior to be a male, was banded (No. 40-319299) on January 23, 1943, at a substation operated by Jim Metcalf at his home about three-quarters of a mile southeast of my home and was trapped at my home station on June 6, 1946. On that date he was marked for sight identification with an orange-colored band and thus became O'Jay. He remained as a permanent resident at my home until his last appearance on September 18, 1950, when at least $8\frac{1}{3}$ years old.

In 1947 his brood of 4 young hatched on May 3 and all were still here until July. In 1948, he and his mate began building on March 19 in an ivy-covered fork of a hackberry tree close to our windows. Eggs were laid April 3-7 while a Tufted Titmouse (*Parus bicolor*) (Laskey, 1957) and a Robin (*Turdus migratorius*) were also laying eggs in their nests; the titmouse had 7 eggs in a box on a tree a few feet west, the Robin had 4 eggs in her nest on a hackberry limb some 20 feet east. All of these nests were entirely successful, the Robin fledging 4 young on May 1, the titmouse 7 young on May 9 and the Blue Jay 5 young on May 11. There were no conflicts noted between the families. The main items of food brought by the O'Jays to the nestlings were the pupae of the tent caterpillar (*Malacosoma americana*). These were extracted from the cocoons at some distance from the nest and several carried inside the mouth at one time to the young. In April and May, one pair of Blue Jays can destroy hundreds of the cocoons, thus eliminating potential thousands of eggs due to hatch on fruit trees the following spring (Laskey, 1954). F. E. L. Beal mentions Blue Jays as destroyers of tent caterpillar eggs in winter (1915 and 1926:19).

Although the 5 fledglings had started to pick up food for themselves in early June, they continued begging from their parents and were fed bread as late as August 18, 1948, when about 4 months old.

In March 1949, O'Jay and his mate built a nest in the west section of the banding station about 100 feet from the 1948 nest site, but abandoned it to start another on March 30 in the same tree that they had used for the 1948 brood of 5 young.

In 1949, *three* of this 1948 brood of the O'Jays returned to the banding station, a remarkable and unusual ratio of returns from one brood. One of them, a color-banded female named "Blink," mated with an aluminum-banded bird and *used the nest* that her parents had built and abandoned in March. She laid 5 eggs (April 27-May 1) which hatched May 16 and 17. The 4 surviving young left the nest on June 6. They disappeared later that summer, but one of them, R. G., grandson of O'Jay, returned in 1950, left in September, returning in April 1951 for that summer.

Blink did not migrate for her second winter (1949) and was seen feeding amicably with her parents, the O'Jays.

In 1950, she disappeared in September, returning in April 1951 to remain until October 7. She returned in April 1952 and was trapped a few days later, soiled with the clay she was molding into her nest cup. She was not seen after June when she was 4 years old. Blink provided a number of pertinent observations: she was the only bird in my experience that used a nest built by her parents; she nested at one year of age and laid a full complement of 5 eggs, although she nested later in the season than her mother.

After abandoning their unused nest in 1949, the O'Jay pair quickly built a new one near our house. By early April, the female was incubating a set of 4 eggs which produced a single fledgling that left the nest on May 10 and was still here in August. One egg had disappeared during incubation and 2 addled eggs remained. The O'Jays built another nest 30 feet up on a horizontal limb of a nearby hackberry tree. On June 20 when a boy climbed to the nest for me, a single nestling dropped to the ground while the parents were flying about, excitedly, giving alarm calls. It left a day or two prematurely. One addled egg remained in the nest. I hand-raised the nestling, releasing it on July 16 when it had learned to pick up food, but have no further data on its survival. The O'Jays, being deprived of their nestling, proceeded with a third nesting for 1949 (not located). On August 10, they were feeding two short-tailed fledglings. Both of these young birds left the station in September and *both returned in 1950*. One of them returned in 1951, 1952, 1953 and was trapped on June 8, 1956, minus the color-bands (age 7 years). Although the O'Jays had three nests in 1949, they raised only three young to independence in comparison to five young for the one nest of 1948.

In 1950, two young left the nest on May 13; one was trapped last on June 12 and the other on July 2. Apparently they raised no others that year. For the 4 nesting seasons, they had 15 young from 6 nests, averaging 2.5 per nest and 3.7 per season.

Although O'Jay had the same mate for at least the latter three years of his life, she was unusually wary of traps and was not banded. She came within a few feet of me when food was offered, and could be found daily, winter and summer, associating with O'Jay. Old Blue Jays and those that remain for winter are particularly difficult to trap here although they come freely to feeders. Color-banding is necessary to obtain data on such individuals; in 1957-58, a wintering pair, wearing old aluminum bands, have apparently lost their colors and have eluded the traps and my efforts to obtain their records.

NEST DATA

Over a period of 9 years, I obtained comparable data on 10 nests, 7 with 5 eggs each, 3 with 4 eggs each (two were first clutches and one a replacement set). From 47 eggs, 26 young fledged (55 per cent), an average of 2.6 young per nest. Two of the sets of 5 eggs disappeared from the nest during incubation.

Nest-building starts in March here, but the peak occurs in April. My earliest record is a clutch of 5 being incubated April 4, 1946, at my home.

Bent (1946:37) states that the northern Blue Jay ordinarily lays 4 or 5 eggs, sometimes 3, frequently 6 and very rarely 7 eggs. From a search of the literature, it seems that 6 egg sets are not common, and that 7 egg sets are very rare. I was unable to find any cited record of a 7 egg set.

A 6 egg set is cited for Connecticut, Illinois, Michigan and Oklahoma by Sage and Bishop (1913), Ford et al (1934), Wood (1951), and Nice (1931) in their respective State books. Strong (1919) cites a set for New York and for Rhode Island. Stone (1937) cites one clutch of 6 eggs and a brood of 6 young for New Jersey.

Feeding of the female by her mate usually begins in March here, continuing through nest-building, egg-laying and incubation. O'Jay ceased with the hatching of the eggs when he assumed the greater part of food-gathering for the young while his mate brooded. Incubation and brooding were by the female. While incubating, she was sometimes fed on the nest, but more often, she left the nest to meet her mate in a tree 15 or more feet from the nest to receive the food. She assumed the begging posture of a juvenile. During watches totaling 27.9 hours during incubation, O'Jay fed his mate 54 times (1.9 feedings per hour).

In 21 complete attentive periods during incubation, the average time that O'Jay's mate spent on the nest was 42.8 minutes, ranging from 10 to 76 minutes; inattentive periods averaged 7.9 minutes for 29 complete periods, ranging from one to 32 minutes.

In three nests where incubation and hatching dates are known, all eggs hatched in 16½ to 17 days after the laying of the last egg of the set. In O'Jay's nest, the 5 young left at 18 days of age; in Blink's nest, 4 young left when 19 to 19½ days of age (one died previously); a brood of 3 left at 19.5 to 20 days. Young begin some foraging about three weeks later, but may follow parents and be fed occasionally for one or two months longer.

J. R. Arnold (Bent 1946:38) found the incubation period to be 17 days in New Jersey, 17 to 18 days in New York and the nestling period to be 17 to 21 days.

On June 13, 1948, when O'Jay's young were about 51 days old, he hulled a sunflower seed on a brick walk near two of his begging young, then carried the seed inside of his mouth to feed a third youngster in a nearby tree. One of those on the walk attempted to hull a seed. It knew how to hold the seed under its toes at the edge of a brick and to pound with its bill, but it was an awkward and unsuccessful procedure. First it toppled off the walk, landing on its head, then the seed slipped

repeatedly from its toehold. On the following day, the mother gave one of the brood an unhulled sunflower seed which it was able to peck open, consuming the contents in tiny bites. Yet these same youngsters still begged from their parents in August and were occasionally fed. Marshall in Arkansas (1949:189) reports banding a brood of 5 young which came with their parents to his feeder in December, 1948. They were fed from December 2, when he first saw them, to December 17. After that date the young fed themselves and continued coming through February, 1949. Bent (1946:38-39) cites Francis Zirrer's observation of Blue Jays in winter tearing dead mice which he had placed on a feeding shelf and feeding portions to young birds.

SUN-BATHING AND ANTING

In May and June, I have seen Blue Jays sun-bathing as they squatted on the lawn with horizontally-spread wings and head tilted sidewise. This behavior occurs on sunny, humid days. On May 25, 1954, three Blue Jays sprawled in a sunny spot on our lawn about 4 feet apart, undisturbed at my watching them. Bent (1946:45) describes sun-bathing by Blue Jays.

On August 30, 1948, three aluminum-banded Blue Jays arrived at the brick walk feeding location which contained no food at the time. As two of them stood quietly, one was very active, hopping on and off the walk, picking up some tiny object, assuming the awkward "anting" position of standing on its tail, running its bill along the inner surface of its primaries. Quickly resuming the normal position, it would hop to another spot to repeat the performance. After three or four anting manoeuvres, it picked up a dry leaf and rubbed it on the primaries before flying. Examination of the spot revealed at least two species of ants moving about (Laskey 1949). In 1908, an account of "anting" by a Blue Jay was published by Grace Elliott, but she interpreted the act as storing food under the wings (Bent, 1946:41). Whitaker has compiled an excellent résumé of published material on anting by many species of birds, including the Blue Jay, using ants and also many substitute materials (1957).

SONG

At an early age, immature Blue Jays sing a pretty, lengthy, formless song. On July 5, 1953 in mid-afternoon, I heard a very soft song (whisper type) close at hand, but at first could not see the bird. Searching for the singer, I thought it might be a Catbird (*Dumatella carolinensis*) or an immature Mockingbird (*Mimus polyglottos*) or possibly a Starling (*Sturnus vulgaris*). The song was a beautiful, uninterrupted flow of very soft melodious notes. Then I saw the songster, a Blue Jay, exact age unknown, singing with closed bill. Only a movement of the throat feathers indicated the source of the song.

On April 20, 1952 a Blue Jay song sounded like that of a Blue-gray Gnatcatcher (*Poliptila caerulea*). Bent (1946:47) and Goodhue (1919) mention several instances of Blue Jay song.

FOOD-BURYING HABIT

A common habit of wintering Blue Jays is the carrying away of food from a feeding shelf to bury it in the ground or snow. At my station, bread and sunflower seeds are favored for storing. A pair will work steadily to exhaust a large supply, picking up 12 to 15 sunflower seeds, flying off with the mouthful to peck a hole in the ground, deposit several in one spot, carefully covering them with dead leaves. Watching the bird collect seeds for storing, one is given the impression that the bird is swallowing the unhulled seeds. Some of the cache is found later and eaten. I have seen Blue Jays search diligently in a place they had buried food some weeks previously. That many seeds are not found is quite evident in spring when groups of sunflower seedlings sprout on the lawn and in flower plantings. If the bird is collecting seeds for immediate consumption, it will fly to a tree branch, a rock or an exposed tree root to hammer off the hull with the bill as the seed is held under the toes. Sometimes a quantity of hulls will accumulate about a favorite "pounding" spot (Laskey 1942, 1943). Alexander Wilson (1808:17) quotes Bartram: "The Jay is one of the most useful agents in the economy of nature for disseminating forest trees. . . . These birds alone are capable in a few years time to replant all the cleared lands."

MIGRATION

Trapping records of Blue Jays wearing numbered bands, sight records of color-banded individuals and field observations during 25 years indicate that a few are permanent residents for at least a part of their lives, but most of the population migrate in September and return in late March and April. At my home, two to four of the older birds may remain for winter and for nesting.

Five of my banded birds have been reported by Fish and Wildlife Service as recoveries from other states, indicating a southward movement from Nashville to their wintering areas. Three birds banded in May, June and August were killed at Florence, Alabama, in September, January and February, respectively. Two, banded in August, were killed in Mississippi, one at Marietta in November and one at Starkville in December. These indicate flights of approximately 100 to 250 miles in a southwesterly direction. On January 6, 1954, Katherine A. Goodpasture reported a transient flock of 34 Blue Jays in farm country about 15 miles southwest of Nashville where regular observations were being made (personal communication). Sue M. Bell reported a Blue Jay flight on September 29, 1957, in the forenoon, after 9:00 a.m. when flocks of 63, 11, 36, 4, 3 were counted in White County, about 80 miles east (slightly south) of Nashville (personal communication).

At this time (end of December, 1957), there are 957 of the one thousand banded Blue Jays that could have lived one or more years since they were banded. This figure represents the number banded to the end of 1956 (965), minus the 8 banded individuals that were shot or found dead within the first year.

As Blue Jays receive no protection under Federal or State laws, many are shot as living targets. This practice is justified by the assumption that all Blue Jays are habitually destructive to other birds. I have not found this to be true. In 30 years of intensive bird-watching, I have

one observation of circumstantial evidence that a Blue Jay attempted to take nestling Cardinals (*Richmondia cardinalis*) and one instance of a Blue Jay pair usurping a nest being built by Robins. Todd (1940:380) says that the Blue Jay's depredations at nests of other birds have been greatly advertised—perhaps unduly so, and that three-fourths of its food is of vegetal matter and one-fourth almost entirely of insects and small mammals. He also states (1940:382) that one's impression of the Blue Jay may be the result of resentment engendered by an introduction to it in Audubon's portrayal of Blue Jays in the act of breaking and devouring eggs of other species. F. E. L. Beal (Bent, 1946: 40) states that examination of nearly 300 stomachs do not bear out the reports of the nest-robbing proclivities of the Blue Jay.

From records of my banded Blue Jays, I find evidence of a strong attachment to their home area during the breeding season and that 198 birds (20.7 percent of the 957 birds above mentioned) survived from one to 9 years. Of these 27 were recovered when shot or found dead in Nashville, 3 were shot in other states, one was killed in a rat trap, two were paralyzed from poison spray in Nashville and died. The remainder, 165 birds, were re-trapped alive at the banding stations.

Surviving for at least one year were 54 birds; 2 years, 70 birds; 3 years, 23 birds; 4 years, 22 birds; 5 years, 11 birds; 6 years, 5 birds; 7 years, 5 birds; 8 years, 4 birds; 9 years, 4 birds.

Among these, 58 birds had been banded as nestlings. Eight of them (13.8 percent) were found near the place of banding from one to 7 years later. All but one of these nestlings had been banded about my home where systematic trapping was practiced. Most of them were of the O'Jay family. One of them, female Blink, migrated for her first winter, remained with her parents for the second winter and again migrated for the following winter.

Of the 198 birds that survived from one to 9, plus, years, 73 were aged as adults at the time of banding, 70 as first-year birds (sometimes called immature, juvenile or juvenal), 8 as nestlings and 47 were unaged. In my early years of banding, I was not experienced enough to age some summer and early autumn birds. It is still difficult to be sure of age in September after the molt of the juvenal plumage is completed. Earlier in the season the texture of the plumage shows immaturity, particularly in the underparts, which in the juvenal is fuzzy in appearance. The color of the inside of the bill, changing from largely whitish in the first summer to all black by the next spring, is characteristic (Nichols, 1955; Bergstrom, 1958).

O. M. Bryens, Luce County, Michigan (1949) banded 433 Blue Jays in about 25 years. Most of these were trapped in winter when natural food became scarce. Of these, 31 birds (7.2 percent) were retaken in later years, the oldest in its 9th winter, but few after their 4th winter. This drop in numbers after the 4th year corresponds with my tabulations. However, it must be remembered that the older birds become very wary and are much more difficult to trap than the less experienced youngsters.

In January, 1943, Bryens trapped 2 birds from a brood of 4, banded in the nest June 22, 1941, indicating that they had spent the second winter at the hatching place as had the female, called Blink, at my home.

Among the published records of old banded Blue Jays are individuals that reached 10, 11, 13, and 15 years of age (Bent, 1946:45); one in Cohasset, Massachusetts, banded October 10, 1932, retaken March 16, 1944, when about 12 years old (Harding, 1944); one in Wisconsin, banded May 14, 1930, recovered within a mile of the place of banding on February 16, 1943 (Bunting, 1944); another banded at Long Island, New York, on May 11, 1939, was retaken and released at Laurel, Maryland, on January 16, 1948, and March 4, 1952 (Beals, 1952). The latter two birds would be almost 14 years old.

Hickey (1952:119) states: "Although *Cyanocitta cristata* is one of the commonest breeding birds in eastern North America, no statistics have been published on the mean number of eggs or the mean number of young." In his summary, based on records of banded birds in the Fish and Wildlife Service files, he states "the mean adult mortality rate was computed as 45 percent per year, but band loss perhaps distorted this result slightly." The oldest Blue Jay in his study died in its tenth year of life.

SUMMARY

Between 1932 and 1957, 1,000 Blue Jays were banded at my stations in Nashville, Tennessee.

A male, known to have lived $8\frac{1}{3}$ years had the same mate for at least three years, the pair being permanent residents during this period. Three of their 1948 young and two of their 1949 young returned in later years, as well as a grandson of 1949.

Clutches consisted of 5 and 4 eggs; incubation and brooding were by the female. Courtship feeding of the female by her mate started in March, and continued until the hatching of the eggs when the male assumed the greater share of food-gathering for the nestlings. Incubation period in 3 nests was $16\frac{1}{2}$ to 17 days; nestling period 18 to 20 days.

At one nest, the average attentive period was 42.8 minutes, ranging from 10 to 76 minutes; periods off the nest averaged 7.9 minutes, ranging from one to 32 minutes. During watches totaling 27.9 hours, the male fed his mate 54 times, 1.9 feedings per hour.

The main items of food brought to their brood of 5 nestlings were pupae of tent caterpillars, thus eliminating potential thousands of larvae that would have fed on fruit trees the following spring.

From 47 eggs in 10 nests, 26 young fledged (55 percent).

Sun-bathing, anting, singing and food-burying were noted.

Most of the summer residents left in September and returned in late March and April.

Five birds were found in winter season from 100 to 250 miles southwest of Nashville.

A few birds remain as permanent residents. One bird, a female, banded as a nestling, changed her status, migrating for her first winter, remaining with her parents for the second winter and again migrating for the third winter.

Of 959 birds banded (1932-1956) that could have lived at least one year at this time, 198 (20.7 percent) survived from one to 9 years. Fifty-eight of these had been banded as nestlings: 8 of them (13.8 percent) were found near the place of banding from one to 7 years.

ACKNOWLEDGMENTS

I am indebted to a number of young friends for help in trapping Blue Jays at various periods of this investigation: Billy Hamilton, Charles Hunt III, Francis Lawrence, Arthur McMurray, Jim Metcalf, Leo Rippey, Cynthia Tompkins, Norman Tompkins.

To Dr. Margaret M. Nice, I am indebted for encouragement and for the reading of the first draft of the manuscript and for suggestions.

BIBLIOGRAPHY

- BEAL, F. E. L. 1915, 1926. Some Common Birds Useful to the Farmer. Farmer's Bull. No. 630, U. S. Dept. of Agr., Washington, D. C.
- BEALS, MARIE V. 1952. New Age Record for a Blue Jay. *Bird-Banding* 23: 168.
- BENT, ARTHUR CLEVELAND. 1946. Life Histories of North American Jays, Crows, and Titmice. Smithsonian Institution, Washington, D. C.
- BERGSTROM, E. ALEXANDER. 1958. Random Notes on the Blue Jay. *Bird-Banding*, 29: 43-44.
- BRYENS, OSCAR MCKINLEY. 1949. Some Notes and Observations on Blue Jays. *Jack Pine Warbler* 27: 98-102.
- BUNTING, HENRY. 1944. Interesting Maine Records. *Auk* 61: 149.
- FORD, EDWARD R., Colin C. Sanborn, C. Blair Coursen. 1934. Birds of the Chicago Region. Chicago Acad. Sc.
- GOODHUE, ISABEL. 1919. The Song of the Blue Jay. *Auk* 36: 111-112.
- HARDING, KATHERINE C. 1944. A Twelve-Year-Old Blue Jay. *Bird-Banding* 15:115.
- HICKEY, JOSEPH J. 1952. Survival Studies of Banded Birds. U. S. Dept. of the Int., Fish and Wildlife Service, Washington, D. C.
- LASKEY, AMELIA R. 1942. Blue Jays Burying Food, *Migrant* 13: 72.
1943. The Seeds Buried by Blue Jays. *Migrant* 14: 58.
1949. A Blue Jay "Anting." *Migrant* 20: 37-38.
1954. Blue Jays Feed Tent Caterpillar Pupae to Nestlings. *Wilson Bull.* 66: 65-66.
1957. Some Tufted Titmouse Life History. *Bird-Banding* 28: 135-145.
- MARSHALL, TERRELL. 1949. Late Blue Jay Nesting. *Wilson Bull.* 61: 189.
- NICE, MARGARET MORSE. 1931. Birds of Oklahoma. Univ. of Okla. Press, Norman.
- NICHOLS, J. T. 1955. A Criterion for Young-of-the-year in the Blue Jay. *Bird-Banding*, 26: 27.
- SAGE, JOHN HALL and LOUIS BENNETT BISHOP. 1913. Birds of Connecticut. State Geological and Nat. Hist. Survey, Hartford.
- STONE, WITMER. 1937. Bird Studies of Old Cape May. Delaware Valley Ornith. Club, Acad. Nat. Sc., Philadelphia.
- STRONG, W. A. 1919. *Oologist* 36: 51.
- TODD, W. E. CLYDE. 1940. Birds of Western Pennsylvania. Univ. of Pittsburgh Press, Pittsburgh.
- WHITAKER, LOVIE M. 1957. A Résumé of Anting with Particular Reference to a Captive Orchard Oriole. *Wilson Bull.* 69: 195-262.
- WILSON, ALEXANDER. 1808. American Ornithology, Vol. 1. Bradford and Inskip, Philadelphia.
- WOOD, NORMAN A. 1951. Birds of Michigan. Univ. of Mich. Press, Ann Arbor.
- 1521 Graybar Lane, Nashville, Tennessee.